

# Shaper IN

**Robust and reliable** multifunctional system for positioning and attitude determination, designed for **UxS and manned aviation applications**

Based on time-tested NovAtel SPAN GNSS+INS technology, SHAPER-IN provides mission-critical reliability in position and attitude determination. Through the combination of professional GNSS receivers and low-noise commercial grade gyros / accelerometers, this small single-box solution ensures consistent and reliable operations in GNSS-denied and spoofing-rich environments as well as exceptional accuracy and precision in Aerial Survey applications

## Key features:

- Deep coupling of GNSS and inertial measurements ensures improved bridging during GNSS interruptions and rapid signal reacquisition
- Fully compatible with Horizon Helios Avionics professional cockpit software
- Effective Interference Mitigation technology and next-generation multi-level Anti-spoofing algorithms
- Consistent trajectory recovery even in GNSS outage conditions
- Easy integration into complex technical systems
- Reliable and accurate positioning and altitude data for most UxS autopilots on the market.
- Capable to support simultaneous connection of two digital cameras
- Built-in SMART controller for receiver operations enhancement, as well as raw data and Event Markers logging
- Commercially exportable system with powerful Defense functions
- User Friendly WEB interface for system configuration and GNSS receiver's performance monitoring and interference evaluation
- Available in enclosure and as OEM versions



## GNSS Performance

### Frequency (Tracking & Position):

**555 hardware channels for simultaneous tracking of**

- **GPS:** L1 C/A, L1C, L2C, L2P, L5
- **GLONASS:** L1 C/A, L2 C/A, L2P, L3, L5
- **Galileo:** E1, E5 AltBOC, E5a, E5b, E6
- **BeiDou:** B1I, B1C, B2I, B2a, B2b, B3I
- **QZSS:** L1 C/A, L1C, L1S, L2C, L5, L6
- **NavIC (IRNSS):** L5
- **SBAS:** L1, L5
- **L-Band:** up to 5 channels

### GNSS Accuracy (RMS)

#### Single point position:

- Single point 1.2 m
- SBAS 60 cm
- DGPS 40 cm
- TerraStar-C PRO 2 cm

#### PPK combined

#### with INS measurements:

- Horizontal 0.2 cm + 0.5 ppm
- Vertical 0.3 cm + 1 ppm

### Attitude Accuracy (RMS)

#### Real Time

- Roll / Pitch 0.013°
- Heading 0.070°

#### Post-Processing

- Roll / Pitch 0.005°
- Heading 0.010°

### Maximum data rate

- GNSS measurements up to 20 Hz
- GNSS position up to 20 Hz
- INS solution up to 200 Hz
- IMU raw data rate 200 Hz

### IMU performance

#### Gyroscope performance:

- Technology MEMS
- Dynamic range 450 °/s
- Bias instability 0 0.8 °/hr
- Angular random walk 0 0.06 °/√hr

#### Accelerometer performance :

- Technology MEMS
- Dynamic range 10 g
- Bias instability 0.012 mg
- Velocity random walk 0.025 m/s/√hr

### Interfaces:

- Wi-Fi: built-in WEB UI for pre-launch preparation and inspection, including an Interference Tools Kit
- 1 UART (LVTTTL)
- 1 Filtered UART (LVTTTL)
- 1 COM port (RS-232)
- 1 USB device (2.0, HS)
- 2 Event markers input (connection of two cameras)
- Built-in SD card memory (up to 64 GB) for raw data recording

### Connectors Type:

- PA FAMILY Connectors for main interfaces and power
- Type C for USB
- SMA female for antenna

### Physical Characteristics:

#### OEM

Dimension: 100x56x22mm

Weight: 73g

#### Enclosure

Dimension: 115x60x28mm

Weight: 150g

